QA30 – Cereal in Infant Bottle

QUESTION:

A pediatrician instructed a new mom to put rice cereal in her infant's bottle to increase the calories. As far as I know, infants should not be introduced to cereal until 4 months of age and/or they have the physical cues (holding head up, etc.). He also told her to cut the nipple larger. To me this is a form of force feeding.

I am looking for resources/references to back up my argument that this practice is wrong. Does evidence show that this can cause developmental harm?

ANSWER:

If rice cereal is added to infant formula, it increases energy density by adding mostly carbohydrate, with very little protein, vitamins or minerals (other than iron); this becomes a problem if the infant is not taking in enough formula to meet these nutrient needs. A more balanced way to increase the energy density of formula is to concentrate to 24 kcal/oz, by decreasing the water added to liquid concentrate or powdered formula. If energy needs are very high, further addition of carbohydrate and/or fat can be done to increase to as high as 30 kcal/oz (must make sure that protein and vitamin and mineral needs are being met with the formula, as carbohydrate and fat can also "dilute" nutrients).

If rice cereal is used to increase energy density, it may result in early satiety, defeating the purpose of increasing caloric concentration. In a study by Shulman, et al, absorption of energy and protein from rice cereal mixed with formula was well tolerated, but did not result in increased net energy and nitrogen absorption in infants 16-40 days of age. Stool excretion (dry weight) increased more than fourfold when the diet of the infants was changed from formula alone to formula plus rice cereal. Thus cereal may be a very inefficient way to increase energy intake in infants.

When an infant is ready to start "semi-solids" (between 4 and 6 months of age), s/he should be fed with a spoon, to promote normal feeding development.

Rice cereal, mixed with formula has been used as a treatment for gastro-esophageal reflux for many years; however, this is a controversial practice. It has not been shown to decrease reflux, and has been associated with increased coughing after feedings.

Rice cereal is also used to thicken feeds for infants with swallowing disorders. This is efficacious in many cases; but there are still concerns about "diluted" nutrients, as well as adequate water intake.

References:

1) Queen, King-Helm, Lang, Handbook of Pediatric Nutrition Second Edition, Aspen Publishers, Inc. Gaithersburg, Maryland, 1999 pp 82, 85, 93, 539-40.
2) Pediatric Manual of Clinical Dietetics, Pediatric Nutrition Practice Group, American Dietetic Association, 1998, pp 54, 236.

3) Shulman, Boutton, and Klein, Impact of Dietary Cereal On Nutrient Absorption And Fecal Nitrogen Loss In Formula-Fed Infants. J Pediatrics, 1991; 118:39-43.
4) Bailey, Andres, and Danek, Lack Of Efficacy Of Thickened Feedings As Treatment For Gastroesophageal Reflux. J Pediatrics, 1987;110:187.
5) Orenstein, Shalaby, and Putnam, Thickened Feedings as a Cause of Increased Coughing When Used As Therapy for Gastroesophageal Relux in Infants. J. Pediatrics, 1992; 121:913.